

PROGRESS REPORT  
For  
AUTOMATIC STEREO CORRELATOR  
SC 1305

"Construction of Breadboard System of an Automatic  
Stereo Correlator and Evaluation of the Performance Capabilities  
of such a System"

Period Covered: September - October 1964  
Date: 15 October 1964  
Job No.: SC 1305  
Document No.: OD-103

This is the second monthly progress report, and a revised schedule reflecting the more advanced status of the job is submitted as part of this report.

#### TASK OBJECTIVE

To manufacture a breadboard and to conduct sufficient tests to determine the performance capabilities inherent in a system of automatic stereo correlation as described in the 552 MSC proposal.

#### CURRENT STATUS OF WORK

##### Electronic

Prebreadboard electrical design is about 90% complete. Simulated tests with a "main channel signal amplifier" feeding an "X axis" servo channel through photo switch controlled gates were successfully completed.

The "main channel signal amplifier" consisted of a differential amplifier directly coupled to a dual emitter follower buffer. The buffer was capacitively coupled to a signal to amplitude converter. Normally, the input signals to the main channel amplifier would be taken from the photomultiplier preamplifiers.

The "X axis servo channel" and its gates consisted of the following:

- a) Two (2) common base transistor gates
- b) A channel selector photo switch gate control
- c) A sense selector photo switch gate control
- d) A motor driven scanning disc
- e) A light source

- f) Two (2) RC integrators
- g) A Fairchild type AD03 differential amplifier corrected to provide unity gain at 1.5 megohm input impedance
- h) A servo Systems type A116 servo amplifier
- i) A Diehl type FPE25-11 motor

The scanning disc used for the photo switch contained very narrow slits in order to check the response time of the Texas Instruments' type H35 duo-photo-diodes employed as sensors in the photo switch. Their response time proved to be faster than the maximum scan rates of the system.

Engineering sketches of the circuits have been prepared, and will shortly be released for production. Design of a power amplifier for use in the illumination control circuits is 90% complete, and the amplifier breadboard will undergo tests by 19 October 1964. All major electronic components have been purchased, and 90% have been received.

#### Opto-mechanical

All major optical and mechanical designs have been completed. Assembly drawings are 60% completed. Fabrication started on 7 October 1964. Approximately 50% of the detail drawings have been released. All purchased optical parts have been received.

PROBLEM AREAS ENCOUNTERED

The problem of rapidly feeding signals to the integrator during the slot slit scanning time and maintaining the charge for a full revolution was encountered. It was overcome by utilizing a differential amplifier with 1.5 megohm input impedance to determine the difference between the integrators charge states. The forward direction input impedances of the signal sources are very much lower; and, therefore, the "feed in" time constants are very much less than the storage time constants.

A potential problem in the adjustment of the scanning slits has been recognized, and a jig has been designed to facilitate adjustment.

No major problem areas, except the two stated, have been encountered to date.

DOCUMENTATION OF VERBAL COMMITMENTS AND/OR AGREEMENTS

None have been made.

PROJECTED WORK FOR THE NEXT REPORTING PERIOD

1. Completion of all prebreadboard electrical design.
2. Breadboarding and test of the illumination controls.
3. Substantial progress in the fabrication of the equipment.

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	SEPTEMBER					OCTOBER					NOVEMBER					DECEMBER					JANUARY				
	31-4	7-11	14-18	21-25	28 - 2	5 - 9	12-16	19-23	26-30	2 - 6	9-13	16-20	27-31	7	30 - 4	7-11	14-18	21-25	28- 1	4-8	11-15	18-22	25-29		
Design, Bread-board & Test Illumination Control																									
Build Bread-board electronics																									
Debug Bread-board Electronics																									
Adjust Scan Optics & make Preliminary Evaluation																									
Readjust Optics & Circuits Based on Preliminary Evaluation																									
Evaluate & Demonstrate																									
Prepare Final Report																									

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SEPTEMBER

OCTOBER

NOVEMBER

DECEMBER

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	31 - 4	7 - 11	14-18	21-25	28 - 2	5 - 9	12-16	19-23	26-30	2 - 6	9 -13	16-20	27	30-4	7 - 11	14-18	21-25	28 - 1	4 - 8	11-15	18-22	25-29
Mechanical & Optical Design																						
Electrical Design																						
Purchase Parts																						
Breadboard & Test Typical Photo Switch																						
Breadboard & Test Typical Channel Electronics																						
Prepare Schematics for Servo Channels & Main Channel Amplifier																						
Build OPTO-mechanical Breadboard																						